

Cancer Proteomics - More than a glimpse



APAF - AUSTRALIA'S PREMIER PROTEOMICS PROVIDER SINCE 1995

APAF's mission is to assist the scientific community address their protein analysis needs. Australian Government support has enabled APAF to create a world-leading proteomics analysis facility containing the latest infrastructure for advanced protein analysis. Our strengths in comparative analysis, along with absolute protein quantitation, have increased our capabilities to deliver leading edge proteomic services.

Cancer Proteomics explained

Proteomic technologies are playing a greater role in cancer research to augment genomic studies. Advanced mass spectrometry using high resolution and fast scanning instruments available at APAF will generate deeper information on the cancer phenotype. Cancer proteome technologies are useful for research scientists and clinicians engaged in translational research, to further understanding of altered signalling pathways, monitor cellular effects of new drugs and identify new biomarkers that predict drug response. APAF has a track record of using leading edge proteomic technologies for cancer research with representative examples described below.

Advanced technologies include

• Mapping kinase signalling activities

Phosphopeptide substrates provide an overview of kinase signalling activities. We can enrich for phosphopeptides and detect and quantitate them using high-resolution mass spectrometry. Comparison between kinase inhibited and control samples can reveal activated pathways. (Parker *et al.* Mol. Cancer Ther. 13(7), 2014)

• Identifying novel protein interactions

Co-immunoprecipitation is used to capture protein interactors. Sensitive mass spectrometry of eluates is then used to identify these proteins (Sharma *et al.* J. Biol. Chem. 287(2), 2012)

• Global characterisation of protein post-translational modifications

Using affinity enrichment strategies we can isolate different chemical classes of modifications. Examples include phosphorylation, ubiquitinylation, acetylation and glycosylation. Liquid chromatography and mass spectrometry are combined to identify these. Introduce a labelling

technique such as SILAC to enable relative quantitation between samples. (Chik *et al.* J. Proteomics 108, 2014; Hart-Smith *et al.* J. Proteome Res. 13(3), 2014)

• Protein synthesis/turnover

By incorporating specific heavy isotope amino acids into newly synthesised proteins during cell culture we can use mass spectrometry to identify these proteins and measure their turnover rates. (Ullrich *et al.* Nat. Protoc. 9(9), 2014; Liang *et al.* Cell Mol. Life Sci. 71(17), 2014)

• Measuring Inflammatory marker proteins

Cytokines and other pro-inflammatory proteins are usually found at sub-ng/mL levels, below the normal range of mass spectrometry. We provide an alternative approach using bead-based multiplexed ELISA to quantitate these proteins in sera and cell culture media. Hundreds of specific assays are available. (Khan J. Proteomics 75(15), 2012)

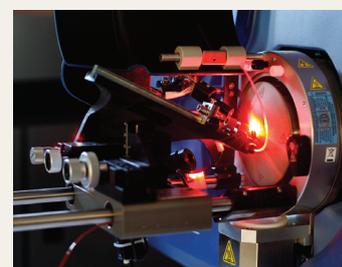
• Protein Biomarkers (Diagnostic, Prognostic, Predictive)

We use fraction, chromatography and sensitive mass spectrometry to screen plasma or tissue/cell samples for putative protein biomarkers. We provide unbiased discovery-oriented analysis from carefully selected cohort groups and can rapidly transition to targeted mass spectrometry to verify these findings. SRM/MRM and SWATH-MS workflows are available. (Krisp *et al.* Proteomics Clin. Appl. 6(1-2), 2012; Jankova *et al.* Mol. Biosyst. 7(11), 2011)

• Circulating free amino acids

The levels of circulating free amino acids in plasma provide insight for patient health status. We have many years of experience in performing amino acid analysis and its application to cancer has become highly topical. (Mayers *et al.* Nat. Med. 20(10), 2014)

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We provide services to:

- Medical Research Institutes
- Pharmaceutical R & D
- Universities
- Biotech R & D

Our expertise includes:

1. Mass spectrometry analysis
2. 20+ years of experience
3. SWATH analysis
4. Free amino acid analysis
5. HPLC techniques

ENQUIRE NOW!

E: lwoods@proteome.org.au

F: +61 2 9805 3101

skype. apafbmd

T: +61 2 9805 3175

M: +61 416 250 739

www.apaf.com.au

APAF - Australian Proteome Analysis Facility Ltd. Level 1, 3 Innovation Rd Macquarie University Sydney NSW 2109 Australia

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